

November 20, 2003

Pat Hitt Duft  
Mallinckrodt Inc./Tyco Healthcare  
675 McDonnell Boulevard  
P.O. Box 5840  
St. Louis, MO 63134

RE: Revised CMS

Dear Ms. Pat Duft:

Thank you for revising the Corrective Measures Study (CMS) to incorporate some of the agency review comments. As agreed, I plan on taking this version to public hearing during early 2004. As such we do not expect you to revise the document in response to any remaining issues, nor has the State of Maine Department of Environmental Protection provided a detailed comment letter on the revised CMS. This letter does contain our initial thoughts on the document and attached to it are the U.S. Environmental Protection Agency's comments (Attachment 2).

Below is a listing of our summarized thoughts organized by area or topic:

Cell Building and Soils:

- Excavation in the cell building will likely require dewatering techniques to achieve the agency desired standard of excavation until 6" into till or 10', whichever is shallower. This will allow access to a larger volume of contaminated soils located at greater depths than the "lower to measurable degree standard" contained in the CMS.
- Contaminated soils over the PMPS (Preliminary Media Protection Standard) need to be elevated above the water table in addition to being placed under a cap. Alternatively, developing a site specific soil-mercury partitioning coefficient could be done to determine if a higher number than 2.2 mg/kg could be left in place under a cap, without elevation above the water table.

#### Landfill #2 and Ridge Area:

- The waste in landfill #4 and possibly landfill #3 may be in contact with groundwater or infiltrating precipitation during large recharge events. The waste in these landfills should be isolated from groundwater and infiltrating precipitation so that the mercury flux will be limited over time. The CMS does not address this issue.
- The ridge landfill groundwater is contaminated with dissolved mercury above the PMPS for groundwater, contrary to language in Section 3.6.

#### Surface Water:

- The culverting of the Southerly Stream was approved with the understanding that once the contaminated groundwater was remediated that the culvert would be removed and the stream would once again be free flowing.
- It is preferable to remove the Industrial Sewer. Alternatively the pipeline beds could be dewatered to observe the base for mercury sources along with documentation that the water table will not rise or create discharge pathways if dams are utilized in lieu of removal.
- Due to the large volumes of water that will be generated with the dewatering actions, the removal of the lined process lagoon should be timed to take advantage of this storage capacity.

#### Sediment

- The agencies requested that Mallinckrodt determine the percent of methyl mercury to total mercury ratio in the sediment at different times of the year and after storm events when sediments would be stirred up. The CMS states that research will be produced that will document that the worst case timeframe was sampled. The Department will need to review the research found to support the sediment sampling. There needs to be enough data to support the statement that the sampling was conducted at the correct time.

The remaining portion of this letter discusses in greater detail several of the above comments.

### Contaminated Soils:

The central area of disagreement lies in the CMS's proposed measures for soils within and immediately surrounding the Cell Building footprint. These are likely to contain free mercury and/or sorbed mercury at high concentrations. Mallinckrodt proposes to excavate "to the extent practical" any such soils with visible elemental mercury. The free mercury or the soil fraction with the highest mercury would be separated and disposed offsite at a licensed facility. The treated soil would be placed with soils and sediments relocated from other areas, above the water table within the groundwater capture area. An impermeable cover would be placed over all relocated soils and over the Cell Building footprint.

The core of the disagreement is the extent to which Cell Building soils will be excavated, treated, and isolated from groundwater. Mallinckrodt proposes these measures only for soils visibly contaminated with mercury, and then only "to the extent practical." DEP believes that soils exceeding the soil PMPS left below the water table will continue to contaminate groundwater above the 2.0 ppb PMPS indefinitely. It is DEP's position that Mallinckrodt must excavate and isolate from groundwater soil that would cause exceedance of the groundwater PMPS. This would include all soil above the 2.2 mg/kg soil PMPS, unless partition testing shows a higher concentration is protective of groundwater. A cover system that prevents infiltration of precipitation would still be needed. An underliner would be unnecessary, as long as groundwater was prevented from mounding into or otherwise coming in contact with the covered soil.

CDM on behalf of Mallinckrodt responds that long-term groundwater treatment will be needed to achieve the PMPS, regardless of the proposed soil treatment measures. Removal and treatment of all soil exceeding the soil PMPS is therefore redundant and unnecessary. It is DEP's position that groundwater treatment may be necessary for ten to twenty years, but cannot be a permanent element of the sitewide remedy. Leaving a source of leachable mercury in contact with the groundwater would make collection and treatment in perpetuity necessary. DEP believes this is inconsistent with the requirement that corrective measures be capable of long-term reliability and effectiveness.

As an alternative to excavation, Mallinckrodt could investigate chemically or physically stabilizing the plant area soil, so that its leachability is permanently reduced below the groundwater PMPS. If this were achievable, the function of the cover system could be reduced to prevention of dermal and ecological contact.

### Dewatering of Plant Area

The control of the level of the water table in the area of the plant needs to be given more thought. With standard pre-construction de-watering Mallinckrodt should be able to achieve the planned "ten feet or six inches into till" investigation and removal of mercury contaminated soil. CDM has used the phrase "would be

excavated to the extent practical considering groundwater condition” in describing their plans for removing the most heavily mercury-contaminated soils. The Department considers thorough pre-construction de-watering to be practicable for the plant-area soil remediation.

#### Landfill #3 and #4:

There is some new material in section 3.6 regarding the Landfill Ridge landfills that appears to be inaccurate. The report states that “Groundwater sampling immediately downgradient of these areas shows that groundwater PMPS are not being exceeded.” Attached is a graph (Attachment 1) that plots trends in dissolved mercury concentrations in monitoring wells that are down-gradient from Landfill 3 and Landfill 4. The data is from the Comprehensive Monitoring Program for 1998 through 2002. Wells MW-410-B1, MW506-B1 and P-2A have mercury concentrations that are usually above the groundwater protection standard concentration of 0.002 mg/l, even as much as seventy times the standard. Clearly the PMPS down-gradient of the wastes on the landfill ridge is frequently exceeded, in contradiction of the report. While most of the ground water monitored by those wells travels through the plant area and will be collected by the extraction wells below the Landfill 1 Area, the persistent leaching of hazardous contaminants from these landfills may prolong the time that ground water collection will be required. CDM and Malinckrodt have never acknowledged that these landfills are leaking, but they have never offered a plausible alternative explanation of the persistence of mercury, chloroform, carbon tetrachloride and salts in these wells.

The monitoring data from Landfill 2 and Landfill 5 seems to demonstrate that over some reasonable time the leachable mercury in the soils and wastes at the site will be exhausted. The mercury remaining will be irreversibly adsorbed and the flux to the river will be acceptably small. The monitoring data from around Landfill 4 and Landfill 3 however seems to show ongoing leaching of mercury twenty-plus years after they were capped. Because the data indicates these two areas are different, the Department believes all of the wastes and contaminated soils should be isolated from ground water and infiltration so that mercury flux will be limited over the long term.

#### Industrial Sewer:

The installation of clay dams in the industrial sewer will raise the post-remediation water table above the current level so that the waste in the proposed consolidation unit could be in contact with the ground water at some times of the year. Alternative approaches such as removing the industrial sewer and bedding material and backfilling with permeable gravel may prevent this situation from developing.

Overall, there is great emphasis in the CMS on collection of ground water to protect the river from mercury loading. This approach would leave a large volume of mercury contaminated soils, sludges, and waste in place, and rely on ground water collection and treatment to limit the environmental impact. The limits on excavation “considering ground water condition”, the preemptive decision to not remove the industrial sewer, and the lack of a plan to address the leakage from Landfill 3 and Landfill 4 are all weaknesses of this plan. Ground water collection and treatment is necessary in the short term, but should not be the plan for perpetuity when other viable options exist.

To assist you in preparation for the public hearing, Mallinckrodt should assume that the thoughts contained in this letter would be the Department comments at the hearing. If you have any questions concerning this letter or any of the comments contained in it, please feel free to call me at (207) 287-2651.

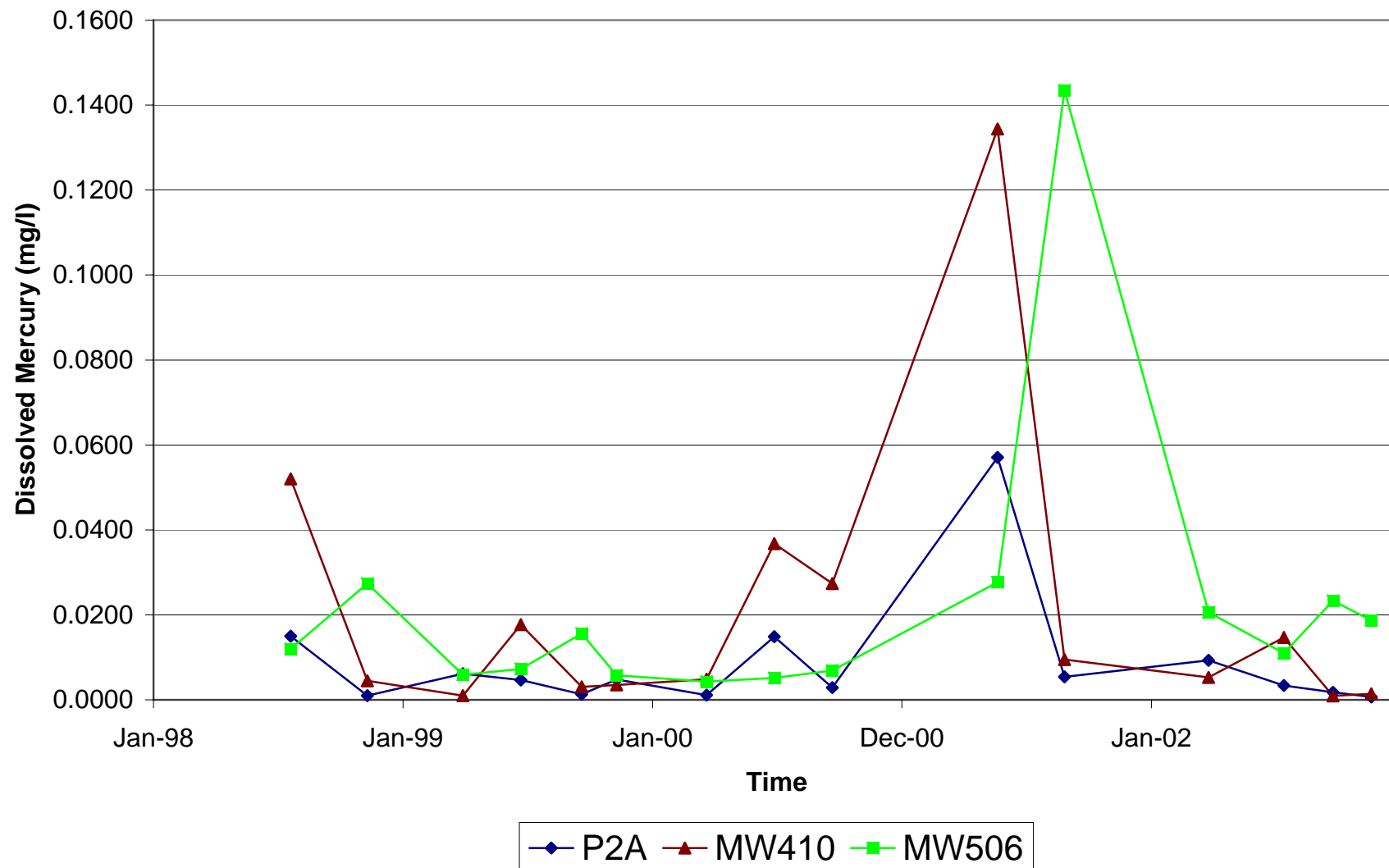
Sincerely;

Stacy A. Ladner, Unit Leader  
Oil and Hazardous Waste Facilities Regulations Division  
Bureau of Remediation and Waste Management

Pc: John Beane, DEP  
Fred Lavalley, DEP  
Deb Stahler, DEP  
Scott Whittier, DEP  
Ed Logue, DEP  
Ernie Waterman, EPA  
Ernest Ashley, CDM  
Jim Grant, Mallinckrodt

Hitt-duft revised cms sl

## Landfills 3 and 4



## Attachment 2

1. Page 2-15: The sentence which reads: AThe average concentration of mercury in the soil from the disposal beds would vary from 8 mg/kg.@ has clearly cut off the other end of a range of average values. Given that the overall range of values detected is present earlier in the section this does not seem to be a critical data gap and would not revise this unless there is a general revision of the document or preparation of an errata sheet.
2. Page 2-19: The sentence which reads: AThe estimated volume of contaminated sediment present at the Southerly Stream is approximately 6,000 cy containing about 18.67 mg/kg of average mercury.@ may be confusing to the lay reader. It should be reworded A...about 18.67 mg/kg of mercury on average.@ if there is a general revision of the document or preparation of an errata sheet.
3. Section 2.4.4: The section is incomplete because 1) it provides no summary of current conditions in the Northern Ditch beyond noting that Amonitoring has demonstrated decreasing concentrations@; 2) it provides no summary of current conditions in the Penobscot River; and 3) it fails to note the other conditions imposed as part of the surface water PMPS
4. Section 3.5.3.2: The assertion presented here that capping will immobilize the contaminants is true only if the area contains no Afree@ elemental mercury which may still move as a non-aqueous phase liquid even if no rainwater is infiltrating through the area. Recognizing this further weighs in favor of alternatives which actively excavate areas where free phase mercury is anticipated.
5. Table 3-4: The compliance status of the excavate/off-site disposal must make the same assumption that soils do not exceed TCLP, can be treated to below the UTS, or will be disposed off outside the U.S. that is imposed on other excavation remedies.
6. Table 3-6: The compliance status of disposal offsite must all make the assumption that soils do not exceed TCLP, can be treated to below the UTS, or will be disposed off outside the U.S. that is imposed on other excavation remedies.
7. Section 3.9.2: This section should provide a better explanation of the role of a cutoff barrier for the layperson. This can be explained in public meetings or other documents and is not a critical data gap. I would not make this revision unless there is a general revision of the document.
8. Section 3-10 and Table 3-8: These two report components are both addressing surface water but do not correspond well with each other creating some confusion as to what is recommended and what is dropped.
9. Section 3.8 The soil alternatives make a distinction between soil options which Aconsolidate@ soil inside the Area of Contamination delimited by the existing Solid

Waste Management Units and other areas of concern and those which involve Aexcavation@ in which contaminated soil is moved to an area outside the area of contamination and RCRA regulations regarding land disposal of hazardous waste are triggered. Sediment from Dredging should look at the same range of disposal options but looks only at Aconsolidation@.

10. Section 4.3.3: The consolidation options need to consider potential changes to ground water regime as part of their implementability evaluation.
11. Section 5.2.3: The No Action/Monitoring alternative for the Chloropicrin Spill Area could include a contingency trigger to re-evaluate more active remedies if insufficient attenuation occurs during the operation of the groundwater capture system.
12. Section 5.3: The dredging alternatives for sediment should consider including soil washing of the highly contaminated granular sediments from the NPDES outfall area.
13. Section 5-5: Pipe lining and groundwater interceptor trenches along the remainder of the Southerly Stream may need to be retained as a contingency option in case other work conducted at the site alters the groundwater flow regime and creates PMPS exceedances in the Southerly Stream. Alterations of specific concern would include groundwater re-injection and any removal of underdrains or other subsurface features within the plant area.
14. Section 6.1: it is unclear whether this section is simply listing components or is listing components in an anticipated sequence of events. If it is the latter the position of groundwater containment should be moved up in the sequence of events.